The Auraria Higher Education Center needed to upgrade energy systems throughout its downtown Denver campus, home to three colleges and 33,000 year-round students. Most of the lighting in 19 campus buildings was old and inefficient, and the aging cooling equipment was not meeting the needs of the campus. What Auraria officials didn't know, at least at first, was how to get the job done and how to pay for it.

"We knew we wanted to do more energy retrofits, since they provide terrific paybacks," said Jim Kelley, director of facilities management at Auraria. "It's smart to do them." But there was no money available from the state for capital improvements, so Kelley turned to energy performance contracting as a way to accomplish the upgrades.

Kelley had been implementing energy efficiency projects for a decade, but preferred to do projects in house and take advantage of federal grant and utility rebate programs that existed at the time to offset capital costs. But he got tired of doing things in a piecemeal fashion, knowing that energy savings were being lost as he waited for the next grant cycle. Energy performance contracting allowed him to get it all done at once.

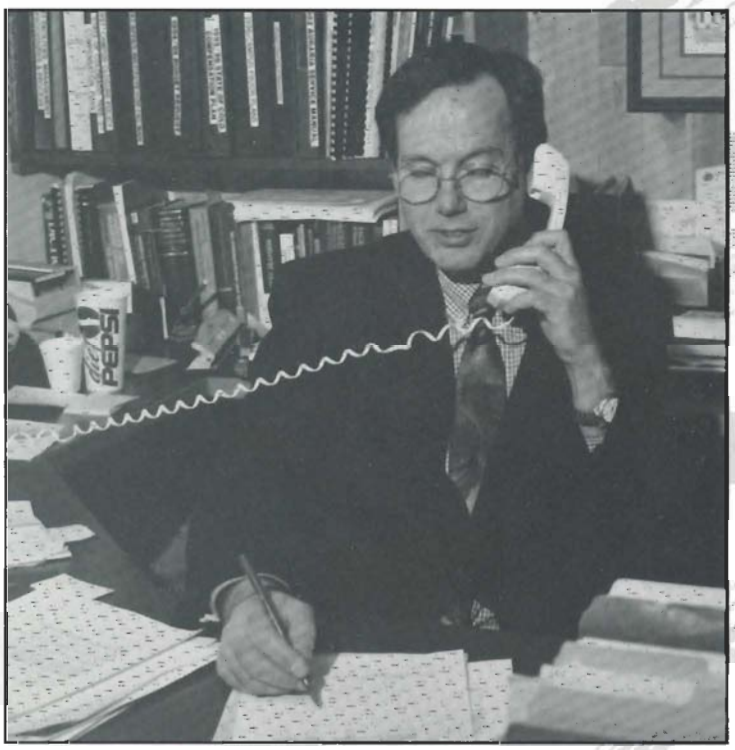
Energy Retrofits Get Top Marks on Campus

Project Description:

Auraria entered into a performance contract with an energy service company (ESCO) and spent $2.1 million to upgrade lighting, replace the cooling tower and chillers, and install a new management control system, laboratory fume hoods, and a new heat recovery system.

Auraria had been having problems keeping buildings cool enough on very hot days, but didn't understand why until the ESCO's energy audit revealed that the cooling tower was too small.

"We knew we wanted to do energy retrofits, since they provide terrific paybacks. It's smart to do them."



Jim Kelley, Director of Facilities Management

Under the performance contract, the cooling tower was upgraded to full size and two 20-year-old chillers were replaced.

"We now have extra capacity and better energy efficiency, and the new cooling system eliminated chlorofluorocarbons (CFCs) used in the old chillers, which we would have had to do away with anyway because of the nationwide phase-out of CFCs," said Kelley.

Auraria also retrofitted over 10,000 light fixtures in classrooms, offices, a parking garage and the student union building. Kelley said replacing the lights was a "major item" that took three months to complete, but added that it was the "best payback part of the project."

Rebuild COLORADO

Better Buildings Today Through Energy Savings Tomorrow

PROJECT DETAILS

Facility: Auraria Higher Education Center, Denver, Colorado

Facility Type: College campus

Facility Size: 1,256,365 (involved in project)

Type of Agreement: Performance contract with guaranteed savings, financed internally through certificates of participation

Project Cost: $2.1 million net cost plus a $444,000 nine-year maintenance agreement ($247,000 received from grants, utility rebates and salvage)

Energy Cost Savings: $284,000 per year guaranteed; savings during the installation year exceeded expectations

Contract Term: 9 years (installation completed in 1997)

Projected Internal Rate of Return: 9.8% (excluding grants, rebates and financing effects)

Projected Profitability Index: 1.4 (excluding grants, rebates and financing effects)

Energy Efficient Features:

- Efficient fluorescent lighting equipment
- New whole-campus energy management control system with upgraded controls in seven buildings
- Improved cooling plant (replaced two chillers, a cooling tower and condenser water pumps)
- Improved fume hood controls with variable speed drives
- Replaced heat recovery system

Benefits:

- Improved lighting quality for a better learning environment
- Better occupant comfort through improved temperature control
- Eliminated use of CFCs in chiller plant
- Improved air quality and safety in fume hood areas

"Besides providing better light, the new lighting also reduces the cooling load, and with the higher efficiency chillers, we've gained in two ways," said Kelley.

Benefits/Results:

Students and faculty already are reaping the rewards of energy performance contracting in the form of improved comfort levels in campus buildings. "We have a much better work environment now, and the new lighting makes everything look better," said Kelley.

He said that although negotiating an energy performance contract can be challenging, Auraria and the ESCO were able to resolve their differences over how much the company would retain as profit and the length of the service contract. "While negotiating a performance contract isn't always easy, we worked through it, and I'd recommend performance contracting to other higher education institutions as a way to make a limited budget go further," Kelley said.

Process:

Auraria took a unique approach to energy performance contracting, using its own funds to finance the energy system upgrades instead of the more typical lease-purchase with a bank. "We elected to borrow the money ourselves because we could get tax-exempt funds with a better interest rate," explained Kelley.

Curt Wiedeman, Auraria's business manager, said Auraria used its own foundation to issue certificates of participation to finance the energy upgrades. Auraria then acquired the equipment from the foundation through a lease-purchase agreement. The guarantee of energy savings under the performance contract helped them safely use their own funds.

"We have a much better work environment now, and the new lighting makes everything look better."

For information, contact:
Rebuild Colorado
Governor's Office of Energy Management & Conservation
225 East 16th Avenue, Suite 650
Denver, CO 80203
303-894-2383 x1203
1-800-632-6662 (toll-free)
rebuildco@state.co.us
www.colorado.gov/rebuildco